

Heritage Trout—A Fish Story

BY NORAH MACHIA

A good fish story is never truly finished—it continues to be shared, sometimes changing as time goes on. This fish story starts with the species itself—the popular brook trout, designated as the official New York State Freshwater Fish in 1975.

Native to New York's coldwater streams and lakes, brook trout have endured the test of time, but their numbers have declined throughout the Northeast during the past century, in part due to habitat fragmentation. The cause of fragmentation and habitat loss is often suburban development and increased paving associated with it. Such development can result in sedimentation, stormwater runoff, and reduced groundwater recharges—all potential threats to brook trout habitats.

Fortunately, DEC researchers and citizen scientists continue to discover populations of native brook trout throughout New York. Some of these fish have been carefully studied and were determined to be “genetically distinct,” confirming their distinct value as *heritage trout*.

Why the Fuss About Heritage Trout?

When fish populations possess their own distinct genetic profiles, it means they have been “reproductively isolated,” and have not crossbred with

stocked fish. These fish have been buffered from intense development and managed to adapt, survive, and thrive in their natural habitats. Having these diverse populations increases the resilience of New York's wild brook trout to climate change.

Studies have shown that wild brook trout have a longer lifespan than their

domesticated hatchery cousins. In fact, scientists believe certain populations have resided in the same protected watersheds for thousands of years.

While several genetically distinct strains have been discovered, they still face the potential destruction of their habitats from outside sources. “Land and water conservation efforts

Remote stream fished in Tug Hill





remain critical for their continued survival,” said Dr. Spencer A. Bruce, a researcher at the State University of New York at Albany (UAlbany). “The documentation of genetically unique brook trout is important because it shows the existence of biodiversity across the landscape. If you plant the same type of corn throughout New York State and a disease comes along, it will wipe it all out. The same is true for fish populations.”

Having unique pockets of species with different genetic profiles means some populations may be better suited to withstand environmental changes than others. That’s why it is important to preserve biodiversity by protecting the natural habitats of these fish.

“Some heritage brook trout populations may hold the genetic key to resilience, in terms of climate change and its effect on natural habitats,” said Fred Henson, a senior aquatic biologist with DEC. “The protection of these watersheds remains critical for heritage trout to continue to survive and thrive.”

New York State has a robust stocking program that provides recreational trout fishing in locations where it otherwise would not exist at a meaningful level if it depended on wild trout. At the same time, DEC has been doing its part to protect wild brook trout populations by carefully documenting their existence. These data have helped state officials avoid stocking decisions that risk diluting valuable genetic resources.

Identifying Unique Strains of Brook Trout

In order to document the existence of “genetically distinct” strains of brook trout, a collaborative effort was made with a group of enthusiastic anglers who volunteered their time to fish (which for many, was really no hardship at all). Representatives from UAlbany, DEC, The Nature Conservancy, and the U.S. Geological Survey were partners in the endeavor.

Many of the volunteer anglers were members of nonprofit organizations that helped with the field studies. In order to ensure accuracy with

the project, Trout Power Inc., a New York-based nonprofit dedicated to protecting, restoring, and enhancing heritage brook trout and their habitats, developed citizen science protocols that were followed by all of the anglers. Members of Trout Unlimited local chapters also followed these protocols when gathering samples in their own communities.

Although volunteers collected their samples in mostly remote areas, the majority were fishing on public access lands. Anglers collected the samples by taking a small clip of the tail fin before returning the fish to the water. The samples were stored in prepared vials filled with a preservative chemical. The vials were then sent to the UAlbany laboratory for genetic analysis.

Using precise methods of extracting DNA from the fin samples, Dr. Bruce and his colleagues were able to determine if the trout was genetically distinct. Having local residents involved in the collection of brook trout samples for DNA testing helped spread the message about the importance of protecting the fish habitats in their own communities.

With the help of volunteer anglers, a number of genetically distinct populations in the Adirondacks, Catskills, and Tug Hill regions have been identified. One strain that was determined to be genetically distinct compared to other genetic profiles in the surrounding area was recently discovered in the Tug Hill region. It marked the first time such a population had been identified in Tug Hill, an indication that these fish may possess adaptations unique to their stream habitats. This is a significant find, and all involved agree that it is important to do everything possible to protect their habitat to ensure the survival of these genetically distinct trout. As such, the exact locations of where the native brook trout were discovered has not been made public, to avoid the potential for overfishing in those areas.

Protecting a Unique Strain

Conservation of the “Heart of Tug Hill” has been a priority of the Tug Hill Tomorrow Land Trust, a nationally accredited, nonprofit land trust established 30 years ago. The land trust protects wildlands, forests, and farms throughout the Tug Hill region, which encompasses more than 2,000 square miles between Lake Ontario and the Adirondacks.

Portions of the core forest were recently identified as “last chance ecosystems” by The Nature Conservancy meaning if the land remains relatively unspoiled, through conservation efforts such as those being conducted by DEC and the Land Trust, the habitats that are important for wildlife species diversity will be preserved.

“This has been a major project,” explained Dr. Bruce. “We are now moving forward with other studies, determining the actual difference between the populations, beyond their DNA, by studying how genes influence the behavior of the fish.”



Volunteer angler in Tug Hill

The protected forestlands in the Heart of Tug Hill give rise to major river systems that provide what many have called world-class fishing opportunities. DEC does stock brook trout in the region, but natural barriers, such as waterfalls and rapids, appear to have prevented the native brook trout from mixing with the stocked population.

DEC continues to protect native brookie populations by carefully reviewing permit applications to ensure projects such as bridge and culvert replacements do not occur during spawning seasons, and that precautions are taken to avoid adding sediment and turbidity into the water. New York State also undertakes a big stocking effort each year, with a variety of species, so there are numerous options for fishing, depending on an angler’s preference.

While there are many anglers who enjoy fishing at sites stocked by DEC, others prefer to head deep into the

woods for an opportunity to discover native fish, to enjoy their beauty, and release them back into the water. For some people, they feel a greater connection to the landscape by fishing for native species. With that in mind, it’s a safe bet that if anglers put some distance between themselves and the nearest locations where domestic brook trout are stocked, the wild brookies they catch will likely be the descendants of the fish that recolonized New York when the glaciers retreated.

And to make sure these distinct strains remain available for future generations to enjoy, biologists will continue to study and protect them, which is great for the species and for anglers.

A former reporter for the *Watertown Daily Times*, **Norah Machia** is a regular contributor to the Northern New York Magazines. She recently released a book, *Tug Hill - Shaping the Future of the Region*.